# 3. PUTTING TOGETHER YOUR SUBMITTAL

EPA has no specified requirements for how an applicant puts together the Environmental Information Document (EID): an EID is effective if it provides the information discussed in Chapter 2, in a form which is easy to use. One key is to organize the EID in a logical manner, both as to the overall outline, and the use of landscape units. It also helps to provide an index which points the reader to the most important facts. A big plus is the effective use of maps, graphics and tables. Ideas on all these aspects of good presentation are provided here, in Chapter 3.

## Ideas about format and organization

Most EIDs are provided in one of two formats.

- Stand alone report. These are documents written for the sole purpose of providing EPA (and others) with environmental information about a project. Tables 1-1 and 1-2, which are outlines for EPA EAs, could serve as outlines for an EID.

- Extracts from a larger report. This occurs when an applicant provides EPA with parts (or all) of a separate document, such as the soils, vegetation, hydrology and other sections of a mine plan. In EPA's experience, EIDs in this format are hard to follow unless there is an introduction or summary which is devoted to environmental assessment; and there is an index which allows EPA to locate the necessary environmental information that is contained within the submittal.

A special situation arises where a single applicant is responsible for several, similar projects and NPDES permits. In these situations, EPA often combines the related environmental assessments into a single document (for example, one document to consider several dairies in one watershed being proposed by one applicant). The result is less paperwork and a more effective assessment of cumulative impacts. Indeed, when EPA discovers that related projects are

being submitted in piecemeal fashion, the process of environmental assessment can be delayed while cumulative impacts are evaluated. Because EPA typically combines such closely-related EAs into a single document, the agency may prefer that the EIDs for these projects also be combined. If your projects fit this situation, please call EPA to discuss the pros and cons of preparing a combined EID.

## Index to the EID

It is important that EPA be able to find the information it needs in an EID. This can be difficult, since EIDs come in many formats. One solution is to provide a reasonably detailed index to the EID. The index will list all the major subjects and terms which an EID reviewer might need to find. About the only situation which would not require an index is a simple EID in which the table of contents is sufficiently clear and complete that all subjects are easily found.

Appendix C to this Handbook is a list of possible subjects for an EID. EID preparers can consult this list to identify terms which could be included in the EID index. A typical EID index will have 20 to 200 entries, depending on the length and complexity of the document. An index should be as specific as possible in pointing EPA to the portions of the document which present information on the project, setting and impacts. For example, an index to a mine plan should indicate the specific pages or subsections where the plan discusses ground water resources and impacts; and not simply refer to a long discussion of water resources which is structured according to mine reclamation guidelines.

There is no legal requirement to index an EID. However, since EIDs which lack a good table of contents or index are difficult to use, EPA's timeframe for preparing an EA usually will be longer for documents which are not indexed, than for those which are organized so that each key piece of information can be easily found. The bottom line is that the form of the index isn't important, but the concept of making information accessible is vital.

Necessary attachments

Correspondence and reports which document coordination and consultation (see Table 2-4) should be included as attachments to the EID. At a minimum, this should include:

- statement from the State Historic Preservation Officer, demonstrating consultation under Section 106 of the National Historic Preservation Act;
- statement from the U.S. Fish and Wildlife Service, identifying potentially impacted threatened and endangered species and, if appropriate, demonstrating consultation under Section 7 of the Endangered Species Act;
- statement from the Natural Resource Conservation Service (formerly the Soil Conservation Service), addressing issues of prime farmlands; and wetlands on agricultural lands;
- statement from the Army Corps of Engineers addressing impacts to wetlands and/or floodplains;
- information to determine if the site is located within a floodplain, as defined by the Federal Emergency Management Agency.

Appendix E to this Handbook provides an example of each category of letter. Depending on the project, other documentation may also be required; see Table 2-4. In any event, all appropriate agencies and persons consulted should be identified.

Style: technical quality

EIDs should be clearly written in plain language. There should be a minimum of technical jargon and any necessary technical terms should be defined. EIDs should be as brief as practical, given the requirements that all important information be presented. The information which is presented should be current and well-referenced and data gaps should be clearly identified. Project-specific data should be gathered and analyzed using proven methods, or reasons for special methods explained.

Care should be taken to avoid statements which are ambiguous, internally inconsistent, and/or biased. "Bias" in this sense means statements which appear to advocate conclusions favorable to an applicant, when those conclusions (typically about impacts or alternatives) are not supported by available data and analyses.

Controversies should be dealt with directly and objectively. Where impacts are potentially significant, it is useful to include a worst-case assessment which reflects the effects of maximum project operations on the most sensitive environmental receptors at times of unfavorable conditions (e.g. atmospheric inversions; low stream flows).

## Maps and graphics

Maps. EIDs need not be elaborate and long documents: the best documents make a clear, concise presentation of the important facts. The effective use of maps, graphics and tables is one way of conveying extensive information, without extensive text.

Poor maps are one of the most common failings in EIDS. While maps provided in an EID don't have to be works of art, they do need to be clear and effective. Features which enhance maps include: a descriptive title; an inset map if needed to show the regional location of the main map; good labels; a scale (graphical scales are preferred); a north arrow (unless it is obvious that north is at the top of the map). For many purposes, a simple but effective approach is to use a USGS topographic map as the base, adding project-specific information as appropriate. When available for an area, such maps have the advantage that they show local topography and cultural features, photocopy well, and are relatively inexpensive.

Several figures are provided here to illustrate maps (and other types of graphics, along with tables). With only a few exceptions, all the examples are from environmental assessments or impact statements prepared by Region 6 of EPA, with the technical assistance of its current NEPA Mission Contractor, Lee Wilson & Associates, Inc.

Regional map. Maps at a regional scale are used to show the project location, and to display environmental information over a large area. All

EIDs should provide at least one regional-scale map, even if it is just an inset to another map.

- Figure 3-la is a representative location map, in this case showing an area involving barrier island restoration in southern Louisiana. It uses a topographic base map and provides an inset map, scale and title.

- Figure 3-2 is a location map for an EA in eastern Oklahoma; the assessment dealt with project-level and cumulative impacts from three coal mines and an ash-disposal facility, all owned by the same company and all serving the same power plant. The map uses a topographic base, includes an inset, and provides a graphical scale. Mine locations and major drainage features have been added using press-on letters. Note that the map has a scale (1:100,000) that allows showing of all four mines; the map was copy-reduced to fit onto a standard (8.5 X 11) page size.

- Figure 3-3 is a location map for a delta building project along the Louisiana coast; it is from an EA prepared by the National Marine Fisheries Service. In this case, an air photo has been used as the base, and is very effective in showing the locational relationships of geographic features in the project area. An inset, scale and north arrow are included. However, all of the place name labels should have been placed against the darker background.

Regional-scale maps can be used to present information beyond location, as the following examples indicate.

- Figure 3-4 is a map of the Upper North Bosque Watershed in Texas, showing the location of dairies or Concentrated Animal Feeding Operation (CAFOS) which contribute to cumulative nutrient loadings. Note that different symbols are used to indicate different sizes of the dairies. The underlying base map shows drainage features; there is an inset map; and a graphical scale is provided.

- Figure 3-5, part of a cumulative EA for swine facilities (CAFOS) in Oklahoma, uses a planimetric base (drainage, roads, township/range), with

---

a = Because the figures in Chapter 3 have been copied from other reports, they usually include their own original **figure** number. On each of the maps and charts in Chapter 3, the Figure number for this Handbook appears at the bottom of the page.

feedlots and water table contours added; the map provides a basis for recognizing that several of the facilities are located along ground water flow lines.

- Figure 3-6, from a watershed study in New Mexico, provides information on land ownership. This map is a direct photo-copy of a published map and is in color, for ease of distinguishing the mapped information.

Vicinity map. The principles discussed above - simple maps to present basic information - can be used at a scale which shows conditions in the immediate vicinity of a project.

- Figure 3-7 uses a 1:24,000 USGS topographic map as a base for showing the boundaries of a swine farm CAFO. The map gives the location of barns, lagoons and land application sites (including acreage). Mapping key facilities helps the applicant, his contractors, and EPA in evaluating project effects (and effects on projects) of soils, flood hazards, runoff, and biological and cultural resources, among others.

- Figure 3-8 is a simple vicinity map (in this case the area within a few miles) for a coal mine in eastern Oklahoma; it was used in the same EA as Figure 3-2. The map uses a USGS topographic base map (1:24,000 scale) and a simple permit boundary to show the project site. Note that the legend for this map includes the NPDES permit number along with additional location information; a graphic scale and north arrow also are provided.

As was the case for regional maps, vicinity maps can be used for purposes beyond showing locations.

- Figure 3-9 provides extensive detail on watershed geography and water monitoring locations for two of the coal mines shown in Figure 3-2.

- Figure 3-10 shows important features of a power plant project in northwestern Arkansas. Both maps rely on a USGS base, have a graphic scale, and include a north arrow. However, the base in Figure 3-10 is not as effective as it could be, because it is a copy of a copy of an original.

Project maps. For some EIDS, a map showing the immediate project site is useful in order to display the layout of project features and their relationship to environmental factors.

- Figure 3-11 is such a project layout for an aluminum refinery in Louisiana.
- Figure 3-12 shows the same area, with floodplain information added.

Other types of graphics. Maps are not the only type of graphic which is suited to an EID. Many types of environmental information are well-presented in diagrams or graphs. Examples are provided as follows.

- The U.S. Bureau of Reclamation is preparing an environmental assessment of a project which will control the inflow of brine to the Canadian River in eastern New Mexico. The flow system is extremely complex, and difficult to explain in words; but relatively easy to explain when accompanied by a block diagram (see Figure 3-13).
- Flow charts are a type of graphic which show key interrelationships. Figure 3-14 is a chart showing the related features for a recharge project in south Texas; Figure 3-15 is a water balance chart for a reservoir in the Texas High Plains.
- While EIDs are not scientific documents as such, there sometimes is a need to display data in the form of bar charts or line graphs. Figure 3-16 is an example from an assessment of a reservoir in northwestern Oklahoma; it was used to establish that raising the reservoir level with treated wastewater would cause an increased rate of seepage to ground water.

## Tables

Tables are another effective tool in EID preparation. Tables typically provide a matrix in which data and/or narrative information are presented in column and row format.

Data tables. As used here, "data" means information expressed in numbers or a few words, rather than in long narrative statements. Data tables can go far beyond the simple presentation of numbers, as the following examples illustrate.

- Table 3-la is from an EA for coal-related projects in eastern Oklahoma (see Figure 3-2). The columns represent the four projects, and the rows represent information in several different categories, all related to project location, schedule, size and other features. Presenting the same information in a text format would require several pages, and the information would be less accessible and useful compared to the table.

- Table 3-2 is an example of water-quality data which EPA compiled from a large number of monitoring data sheets which were contained in an EID for an eastern Oklahoma coal mine. The data were far more effective in table form than in the raw form submitted by the applicant, and their use was made even more effective by adding relevant water-quality criteria to the table. Note also that boxes have been used to highlight data points which exceed the criteria.

- Table 3-3 is another data table, this time presenting very technical information about aquifer characteristics at alternative project sites in south-central Texas.

- Table 3-4 is a data table which displays environmental attributes of four different pipeline routes in northwestern Arkansas.

Narrative tables. Narrative tables are, in effect, text presented in condensed or matrix format.

- Table 3-5 (2 pages) is an extreme example. Drawn from a highway EA in west Texas, it is the entire EA discussion of the project's environmental setting. Not only does this table take up little room, but by placing the information in a separate table the EA text was able to focus almost entirely on impacts.

---

a = Because the figures in Chapter 3 are copied from other reports, they often include their, original figure number. On each of map and chart in Chapter 3, the Figure number for this Handbook appears at the bottom of the page.

Tables 3-6 and 3-7 show different types of narrative tables.

- Table 3-6 is part of an analysis of stormwater quality data from west Texas; it is from an EID supporting an application for a stormwater NPDES permit. The exact same information could have been put into a text, but placement in a table saves space and makes for an easier organization.

- Table 3-7 is a simple matrix of data and narrative information for a sewer project on Indian lands in western New Mexico.

Tables with figures. Finally, it is sometimes effective to combine graphic and table information on a single page.

- Table 3-8 is from an EIS for a power plant in south-central Texas, and may be more elaborate than appropriate for many EAs. Nonetheless, it is useful to show how information on air quality conditions and mitigation measures can be shown in data table, narrative table and map format, all on one sheet.

- Table 3-9 is text and a map showing geomorphic information for barrier islands in Louisiana.

## Organizing information according to landscape units

A special type of map and narrative table is one where environmental information is organized according to landscape units (sometimes referred to as natural units, ecological units, or land systems).

Figure 3-17 and Table 3-10 are examples from a sewer line EID in central Oklahoma. The applicant identified three major landscapes in the project area: bottomlands, prairie uplands and forested uplands. Information is provided in narrative table format regarding terrain, drainage, geology, soils, and many other envirorunental attributes on later pages of the table which are not included here. The map shows the location of the units, and doubles as a regional scale geologic and soils map.

Organizing information by landscape units can facilitate the analysis and presentation of environmental impacts.

- Table 3-11 is an example from a grazing lands EIS in southern New Mexico. Fourteen different pieces of information related to erosion are presented for six different natural units. The actual impact analysis was in fact done on a landscape basis; for example, equations for calculating wind and water erosion were applied to each unit, based on slope, soil and cover conditions representative of the unit.

Summary of Presentation tips

If you want to learn more about what belongs in an EID, and how it might be presented, refer to the references which are provided at the end of this Handbook. Several of the references also contain checklists which may help ensure that the EID is complete.

Beyond what is in the literature, the basics are simple: concise text, good maps, and effective tables all enhance an EID. EIDs (and most other technical reports) suffer when poorly organized and/or indexed; when it is hard to locate the project features on a map; and when lengthy text results from discussions of information of marginal value. In comparison, good EIDs show that careful thought has gone into developing an environmentally sound project; they cover all the mandatory requirements, such as agency coordination; and they are objective and candid (not glib and upbeat) about assessing impacts.

EPA has completed many EISs and EAs, but none that are perfect. EPA does not expect perfect EIDs, but it does expect EIDs to be effective in discussing project characteristics, the affected environment, and the direct, secondary and cumulative environmental changes which may result from a project. In short, the better the EID, the quicker and more effectively EPA can complete the environmental prerequisites to its permit decision.

## REFERENCES

Canter, L.W., 1995. Environmental Impact Assessment. Second Edition, McGraw-Hill Book Company, Inc., New York, NY, August 1995.

Carpenter, R. and J.E. Maragos, 1989. How to Assess Environmental Impacts on Tropical Islands and Coastal Areas. South Pacific Region Environmental Programme (SPREP) Training Manual, sponsored by Asian Development Bank, prepared by Environmental and Policy Institute, East-West Center, Honolulu, HA.

Environmental Law Institute, 1989. NEPA Deskbook. Environmental Law Reporter, Washington, D.C.

Freeman, L.R. , F. March and J. W. Spensley, 1992. NEPA Compliance Manual. Government Institutes Inc., Rockville, Maryland.

Glasson, J., R. Therivel, and A. Chadwick, 1994. Introduction to Environmental Impact Assessment. UCL Press Ltd., London, England.

Jain, R., et al., 1993. Environmental Assessment. McGraw-Hill Book Company, Inc., New York, NY.

Murthy, Keshava S., 1988. National Environmental Policy Act (NEPA) Process. CRC Press Inc., Boca Raton, Florida.

Petts, J. and G. Eduljee, 1994. Environmental Impact Assessment for Waste Treatment and Disposal Facilities. John Wiley and Sons, Ltd., West Sussex, England.

SETAC, 1991. A Technical Framework for Life-cycle Assessments. Workshop Report, Society of Environmental Toxicology and Chemistry, Pensacola, FL.

Turnbull, R.G.H., editor, 1992. Environmental and Health Impact Assessment of Development Projects: a Handbook for Practitioners. Publishers, Ltd., London, England., Elsevier Science

Wathern, P., editor, 1988. Environmental Impact Assessment, Theory And Practice. Unwin Hyman Publ., London.

World Bank, 1991. Environmental Assessment Sourcebook. 3 volumes; World Bank Technical Paper No. 140, Washington, D.C.